

THE HEAVENS IN APRIL.
BY HENRY NORRIS RUSSELL, PH.D.

At no time in the year can we see so many bright stars in the early evening as in April. The finest group of them is low in the west, but the eastern skies are not barren, as we shall soon see.

Facing due west, and holding our map so that the words "Western Horizon" are at the bottom, we can at once identify Orion, Taurus the Bull, and Canis Major the Great Dog. The four most brilliant stars in these constellations—Rigel and Betelgeuse in Orion, Aldebaran in Taurus, and Sirius in Canis Major—form a remarkably regular diamond-shaped figure. Above Orion on the left is the Little Dog (Canis Minor), which has one bright star known since Greek times by the name of Procyon. To the right of this lies Gemini (the Twins), whose brightest stars are very appropriately called Castor and Pollux. Farther to the right is Auriga the Charioteer, whose principal star, Capella, is brighter than any we have yet noticed except the incomparable Sirius.

The constellations overhead and in the southern sky make a poor showing compared with those we have left, but contain much of interest. High up, and south of the zenith, is Leo the Lion. The "sickle" which marks his head and the triangle forming his hind quarters are conspicuous alike on our map and in the sky. Between the Lion and the Twins is the Crab (Cancer), which has no bright stars, but contains the interesting star cluster Præsepe (the Beehive), which looks like a fuzzy patch of light to the naked eye, but breaks up into its separate stars when viewed through a field glass.

Below Cancer, and about on a level with Procyon, a small but rather conspicuous group of stars marks the head of the Sea Serpent, Hydra. This is an enormous constellation which stretches clear down to the southeastern horizon, including many stars too faint to be shown on our map, but easily visible to the eye. It has one bright star (lettered α) and sometimes called Alford. This name, meaning "The Solitary One," is very appropriate, as the star stands very much alone, with no equals nearer than Regulus in Leo and Procyon.

On the back of Hydra, lower down, are the Cup (Crater), which is not very conspicuous, and the Crow (Corvus), which is rather prominent. Below Hydra in the southwest is a part of the Ship (Argo), which is never well seen in our latitude.

In the southeast the principal group is Virgo, which contains one star nearly of the first magnitude, Spica, and a good many of the third and fourth. To the left of this is Boötes (the Herdsman), an important constellation including the great yellow star Arcturus, which is one of the finest objects in the heavens.

Hercules and Serpens (the Serpent), which are rising in the east and northeast, are not yet well visible. We turn from them and look right overhead, to find the Great Bear displayed to the fullest advantage. Part of this noble constellation has already passed the meridian, and the Pointers will soon be above the pole. The Bear's tail, otherwise known as the handle of the Great Dipper, hangs far down to the northeast, and her paws (marked by three pairs of stars all lying near the same straight line) reach nearly to the zenith. In the space between the Great Bear, Boötes, Virgo, and Leo are two small constellations. The southern, Berenice's Hair, is a diffuse cluster of faint stars, while the other, the Hunting Dogs, contains but one bright star, which in the telescope proves to be a fine double (as are also the stars ζ in the Great Bear and γ in Virgo and in Leo). Finally, in the north, we find the Little Bear, inclosed within the coils of the Dragon. Cepheus and his wife Cassiopeia are close to the northern horizon, and Perseus is well down in the northwest, following Andromeda, out of sight.

THE PLANETS.

Mercury is morning star in Aquarius and Pisces. He is farthest from the sun on the 14th, when the distance of the two appears to be about $27\frac{1}{2}$ degrees. At this time he rises about 4:30 A. M. and should be easily seen. He is not ill placed for observation for some weeks on each side of this date, and may be regarded as visible throughout the month.

Venus is likewise a morning star in Aquarius, and rises rather more than half an hour before Mercury. As is always the case, she is much the brightest object in the sky, next to the sun and moon.

Mars is in Sagittarius, exceedingly far south, and rises near midnight toward the middle of April. He is approaching us rapidly, and at the end of the month is about 70 million miles away. Though nearer, than the sun, this is almost twice as far as he will be from us at opposition in July.

Jupiter is in Gemini, in exactly the opposite quarter of the sky from Mars, and sets near midnight in the middle of the month.

Saturn is in Aquarius, and rises a little after 4 A. M. on the 15th. He is near Mercury and Venus, all through the month, and is in conjunction with the first on the 9th, and with the second on the 21st, the least distance of the two planets being in both cases

approach it was more than 100,000,000 miles from the earth.

Princeton University Observatory.

THE DEATH OF PIERRE BERTHELOT.

Through the death of Prof. Berthelot, the world has lost a man eminent not only as a philosopher and a scientist, but also a figure prominent in the national politics of France and in the affairs of the world in general. Aside from Berthelot's chemical researches, his labors in behalf of the beleaguered French in Paris during the "Terrible Year" of the Franco-Prussian war, and his political activity brought him to the notice of the world. As the head of the Scientific Committee of Defense of Paris in 1871, he undertook the investigations which practically led to the invention of smokeless explosives. In his researches and discoveries in the synthesis of fats, glycerines, carbohydrates, and alcohol, in coal-tar dyes, in thermo-chemistry and in explosives, he added enormously to the scientific knowledge of mankind. As a Deputy and a Senator his influence in legislation was extensive, and as Inspector-General of Higher Education his work was memorable. That Prof. Berthelot was qualified not only for the activities of the lecture room and the laboratory, was shown by his work as Minister of Public Instruction

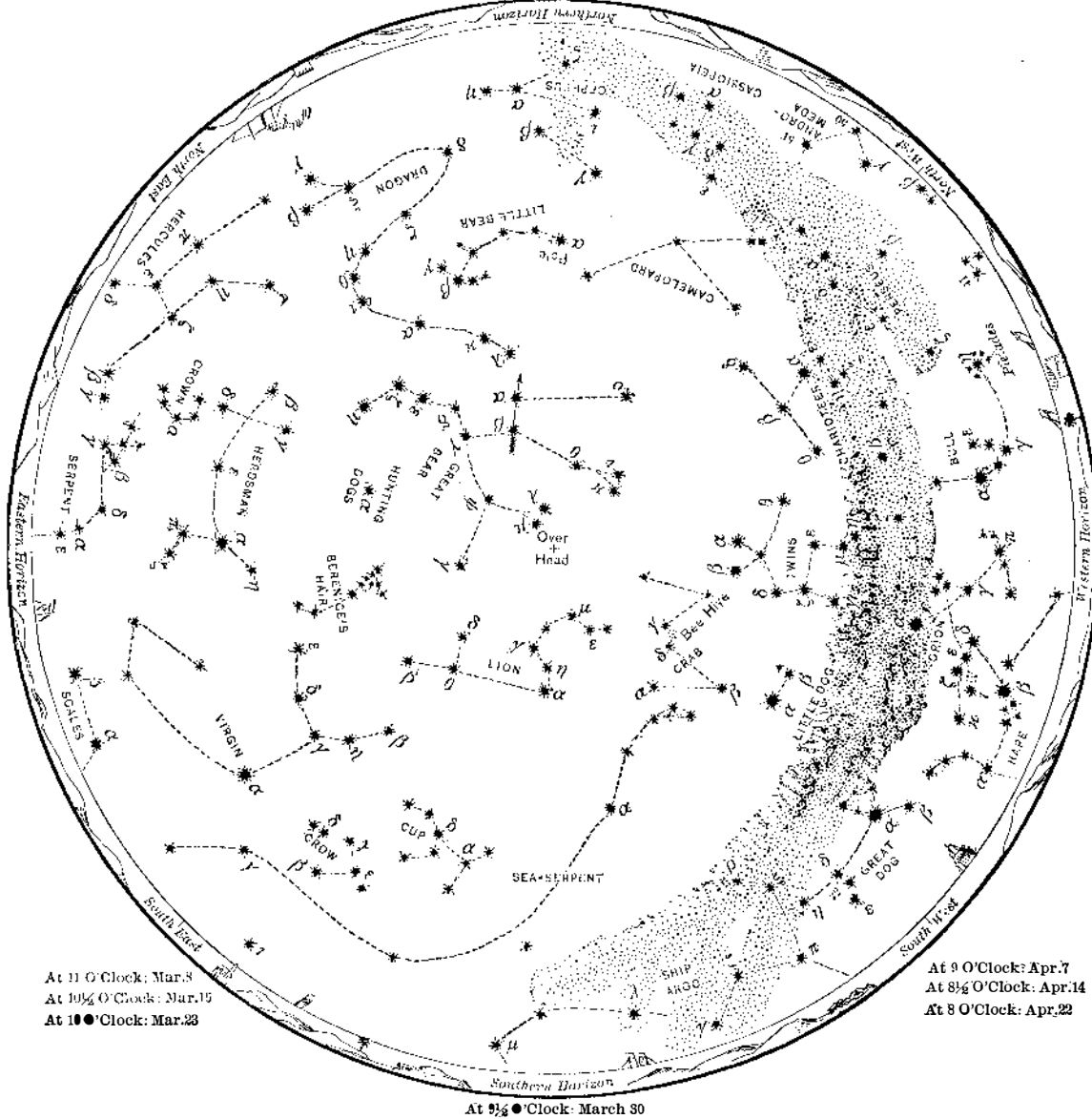
and as Minister of Foreign Affairs. While holding the latter office he fully demonstrated his ability as a political economist and a diplomat. A man of brilliant intellect and great scientific erudition, Berthelot had a most charming and engaging personality, and such were his personal qualities, that to see him was to honor, and to know him was to love.

Pierre Eugène Berthelot was born at Paris in 1827. He was educated at the Collège Henri IV., where he devoted himself principally to research work in organic chemistry. He obtained the degree of Doctor in Science in 1854, presenting a remarkable thesis in which he described his artificial reproduction of fats. Berthelot was the first to produce these important organic products synthetically, notwithstanding that since 1823, when Chevreul effected the decomposition of fats into their constituents, it had been known that they are mixtures of compounds of glycerin with the fatty acids. In the same thesis he showed that glycerin is an alcohol, and thus the idea of polyatomic alcohols was first introduced. In 1851 Berthelot became the assistant to Balard at the Collège de France. In 1860 he was made Professor of Organic Chemistry at the Ecole de Pharmacie, and in 1865 a new chair of chemistry was founded for him at the Col-

ège de France, where he lectured more or less regularly on theoretical chemistry until his death. In 1873 he was elected Member of the Institute, and in 1889 Perpetual Secretary, succeeding Pasteur, of the Academy of Sciences. In 1876 he was made Inspector-General of Higher Education; in 1881 a life member of the Senate. In 1886-87 he was Minister of Public Instruction, and in 1895-96 he was Minister of Foreign Affairs. Berthelot was also a Grand Officer of the Legion of Honor, and he was a member of the most distinguished scientific bodies of Great Britain, the United States, and other lands.

The cost of coal for steam locomotives is approximately 15 per cent of the total operating expenses for steam railroads, and is the largest of the expenses for materials, says the Electric Railway Review. Data contained in the annual reports of a number of the larger systems indicate that the annual coal consumption is, on the average, about 2,500 tons for each steam locomotive. From the United States census report on "Street and Electric Railways," covering 799 operating companies, the cost of fuel for power for electric railways appears to be about \$15,000,000, which is a little over 10.5 per cent of the total operating expenses.

NIGHT SKY: MARCH & APRIL.



In the map, stars of the first magnitude are eight-pointed; second magnitude, six-pointed; third magnitude, five-pointed; fourth magnitude (a few), four-pointed; fifth magnitude (very few), three-pointed; counting the points only as shown in the solid outline, without the intermediate lines signifying star rays.

a little more than the moon's apparent diameter. Uranus is in Sagittarius. On the 3d he is in quadrature with the sun, and comes to the meridian at 6 A. M. Neptune is in Gemini, and may still be observed in the early evening.

THE MOON.

Last quarter occurs at 10 A. M. on the 5th, new moon at 2 P. M. on the 12th, first quarter at 3 P. M. on the 20th, and full moon at 1 A. M. on the 28th. The moon is nearest us on the 2d, farthest away on the 18th, and nearest once more on the 30th. She is in conjunction with Mars on the 4th, Uranus on the 5th, Venus on the 9th, Mercury and Saturn on the 10th, and Jupiter and Neptune on the 18th.

GIACOBINI'S COMET.

A comet, visible in a small telescope, was discovered by Giacobini at Nice on the evening of March 9. It was then in Canis Major, nearly due east of Sirius, and was moving pretty rapidly northwestward in the direction of Alpha Orionis.

The elements of its orbit, which have just come to hand, show that at the time of discovery it was about at its nearest to the sun and already past its nearest approach to us. It is now receding from both earth and sun, and consequently growing rapidly fainter, so that it will not be visible very long. At its nearest